FIG. 9 is a schematic illustrative diagram of a hard wired version of the wastewater sampler;

FIG. 10 is a fragmentary, elevational view of another embodiment of web processing system that may be used in the embodiment of FIG. 1 instead of the embodiment of FIG. 4;

FIG. 11 is a sectional view taken through lines 11—11 of FIG. 10;

FIG. 12 is a schematic view of still another embodiment of web processing system useable instead of the embodiment of FIG. 10;

FIG. 13 is a fragmentary enlarged, elevational view, partly broken away of a portion of the embodiment of FIG. 11;

FIG. 14 is a schematic elevational view of still another embodiment of web processing system;

FIG. 15 is a simplified plan view of the embodiment of FIG. 14; and

FIG. 16 is a block diagram showing a manner in which remote initiating systems may be connected cooperatively to the sampler.

DETAILED DESCRIPTION

In FIG. 1, there is shown a fragmentary elevational view, partly exploded, of a sampler 10 having a pump assembly 12, a computer 14, an intake nozzle 16, a flow-through-channel 18, a front horizontal portion 20 of the wastewater pipe and a sample packaging assembly 22. Wastewater flows through the wastewater pipe and through the flow-through-channel 18 in a continuous flow. During the flow, the computer 14 measures periods of time and activates the pump assembly 12 at preset intervals of time or amounts of wastewater flow to draw samples of predetermined amounts of wastewater.

During the drawing of a sample, the pump pumps at a predetermined rate set to be approximately the rate of flow of the wastewater through the front horizontal portion 20. During this pumping action, the pump pumps wastewater: (1) from the flow-through-channel 18; (2) through the intake nozzle 16 which is inserted into the flow-through-channel 18; (3) through the hose sections 30 and 32; and (4) to the sample packaging assembly 22 which packages it, with one or more samples being totally enclosed in a different sample container such as containers 24A or 24B and moves the samples on a conveyer 25 to a storage container 27.

To provide pumping, the pump assembly 12 includes a peristaltic portion 36 having rollers which receive tubing: (1) a fluid inlet, a portion of which is indicated at 30; and (2) a fluid outlet, a portion of which is indicated at 32. The rollers are driven against a section of hose in a conventional manner by a motor 34 which is energized under the control of the computer 14.

The computer 14 counts revolutions of the peristaltic pump to monitor the purging of liquid from the tubing, starts the formation of a container, pumps a fixed amount of sample into each of the containers, such as the containers 24A and 24B through the hose sections 30 and 32, seals the containers in the sample packaging section 22, cuts the bags so that they drop a short distance onto the conveyer belt 25 and transports the containers on the conveyer belt to the storage container 27. This cycle is repeated for each new sample.

Because the sampler 10 is computer-controlled, samples may be drawn to fit in an individual bag, which may be air tight or may have surplus room, or samples may be periodically drawn with several samples at different time periods being poured into the same bag before it is sealed. The printing mechanism may indicate the nature of the samples in the bag. In this manner, the samples within one bag may be representative of the sampled liquid at one point in time and this is indicated on the bag, or in the case of composite or multiplexed sampling, the liquid in a bag may represent an average of the liquid taken at different time and this is indicated on the bag.

In FIG. 2, there is shown a sectional view of the flow-through-chamber 18 having a portion of the intake nozzle 16, an inlet port 54, an upwardly extending pipe member 44, an outlet port 56, and an outlet pipe 46. The flow stream being sampled is connected to pipe 44, flows through chamber 18 and out of pipe 46. The pump assembly 12 (FIG. 1) draws samples of liquid through the nozzle 16 and channels it into the packaging assembly 22 (FIG. 1) under the control of the computer 14 (FIG. 1).

In FIG. 3, there is shown a broken away, fragmentary, elevational view of the flow through sampler 10 showing the manner in which the hose 32 from the pump assembly 12 extends downwardly from the pump assembly 12 (FIG. 1) to an outlet arm 96 of the packaging assembly 22. The outlet arm 96 receives the hose 32 and supports it through an offset portion 90 and a downwardly extending portion 92. The hose 32 is held in this position by the outlet arm 96.

In FIGS. 4 and 5, there is shown a packaging assembly system 22 having a plurality of cantilevered rollers 60, 62, 64, 66, 68 and 70, a web folding assembly and water entry tube or chute 72 and a reciprocating end seal carriage 74 which provides the sole web transmit motive power. With this arrangement, a continuous web is unwound from the web roll 76 about the tensioning, braking, unwinding and dancing roller mechanism 64.

The movable registration roller 70 can change the length of the web 162 in the travel path and can serve with photodetectors 78 or the like to register pre-printed patterns for an updated printing code entry for example. These are necessary, particularly when changes in package length need to be made. Also, when new rolls 76 are inserted, automatic registration can be effected with pre-printed patterns on the web 162. Chute 72 may be changed if desired, by sliding onto shaft 80 to conform to different web and package widths and different package lengths.

Two layers of the web 162 are sealed longitudinally together by the pivoted heat-seal brake member 82 which pivots about a member 84. The heater therein is just hot enough to seal together two web layers but not to burn the web, so that it is not critical in length of contact time.

The web 162 is advanced by the lateral heat seal and clamping mechanism 86 which reciprocates such as by vertical movement in slot 88 to close and grab the web 162 at its uppermost position and to open and release it at the lowermost position, thereby grabbing and yanking a proper web length from web roll 76 while sealing the web laterally with a heated bar as it travels either during the downward stroke or/and as it rests in an upper position before movement for sealing before liquid flows into chute 72. Heat-seal 82 acts as a brake member to keep the web 162 from reverse movement when engaged. It is pivoted away from the web at pivot member 84 permitting it to move through the web path in timing with the carriage 74. The detailed operation of suitable clamping and sealing mechanism is set forth in